

flats, the roots became entwined, the plants grew too leggy, and often became too hard. A great many cuttings were discarded because of these conditions. The capacity of a house filled with 3-1/2-inch pots is 42,000 plants. Rooting directly in the pot gave us a space problem, but we took care of this by adding a few more houses. Once the house is filled, there is no more shifting until the plants are sorted, packed and shipped. The losses were reduced and the quality of the plants improved noticeably.

All of these changes were made through planning and organizing. Future plans call for: semi-automatic watering, boom spraying in the greenhouses with a tractor, and propagation in open beds without shade. All of you here have a system. Some are on a computerized program, but all spell out the same thing — organization. Any system needs an overhaul now and then to update its operating methods. Constant planning and organizing are key factors in the success of any operation.

FIELD PRODUCTION OF AZALEAS

ROB HOLLINGS

*Carolina Floral Nursery
Monck Corner, South Carolina*

Our method of field production of azaleas at Carolina Floral Nursery spans a time of about 18 months from when the liner is first planted until the finished plant is ready about two growing seasons later. We typically begin planting on the first Monday following the 20th of April.

Bed preparation is a very important process. In the summer preceding the spring planting, we apply limestone to the field at the rate of about 1000 to 3000 pounds per acre. Following that we plant a cover crop of sorghum, usually in August. Sorghum will get 7 or 8 feet tall in a matter of months. The purpose of planting sorghum is to put a lot of organic matter into the ground. Once we dig the azaleas, we must replace as much organic matter as possible. During the winter, we disc the field 3, 4 or maybe 5 times and also subsoil it. Subsoiling is really a very important step in this production to break up the pan that builds up year after year and allow drainage. Furthermore, cracking this hardpan allows moisture from underneath to rise to the surface level of the soil in summer months. After subsoiling, we contract for fumigation of the field with an application of methyl bromide. The tractor rolls ahead injecting methyl bromide down into the soil, and we follow immediately behind, covering the entire field with plastic. We find this gives us field soil that is completely free of insects and most weed seeds.

There are a few seeds, however, that are tough and are not killed by methyl bromide. It also seems to help eliminate a lot of the root rot fungi. We disc and aerate the soil after the methyl bromide has been on for at least 48 hours.

The layout of the beds is our next step. We allow an 80 inch center from alley to alley, which allows for a 5 foot bed and a 20 inch alley to accommodate the tractor tires and equipment. The first step in laying off the bed is to put a pair of middlebusters on the tractor and mark off 5 foot increments down the row the way the beds are running. This helps to define the bed. The next step is to pull a pair of tiller discs through the field. This process throws the soil in the air and piles it up on the bed. The key ingredient of field production is the alley. You can prepare beds, take liners into the field, spray, fertilize, and harvest using equipment pulled through the field. One of our important, and we think unique, pieces of equipment is a modified manure spreader. It will hold about 8 yards of material, and has an adjustable gate. The rate of application can also be controlled by the speed of the tractor. We vary the amount of pine bark and peat according to the density and drainage of the soil. Standard application should be about 3 inches of pine bark and 3 inches of peat. If the soil is heavier, we may add two runs of bark, the second about half as much as the first run. Over this we apply a low nitrogen fertilizer, about 80 pounds to the 2000 square foot bed, or 2 pounds per 100 square feet. We also add about 20 pounds of castor bean meal to 100 pounds of fertilizer to discourage ground moles that can ruin a bed. On top of the fertilizer we add about 75 to 100 pounds of slag in addition to the lime we put on the field the preceding summer. We have found a pH between 5.5 and 6.0 to be ideal for a deep root system on azaleas. Following this we lightly irrigate the soil to improve the workability and prevent peat and bark from blowing in the alleys. We then rototill the beds to a depth of 6 or 8 inches. We have cut an arch in the cowl with a 3 or 4 inch rise in the center. This allows for contour of the bed to be shaped as the tiller passes over the bed. We feel drainage of azaleas is very important. The rounded shape of the bed prevents a slump as the bed weathers over the next 2 years.

The last step in preparing the beds is to roll them. We have a custom-built drum that is again 5 feet wide; the middle of the drum is squeezed slightly so when it is placed on the bed it will follow the contour and lightly pack it. A series of 5 hoses are attached to the drum in order to make longitudinal marks down the bed as a guide for planting.

Two of the 3 elements for good azalea growth are in the beds at this point. We feel the bed has good nutritional quality

and good drainage capacity. The other important element is water. Azaleas need water, but they must also have good drainage.

At planting we start with liners out of the greenhouse. If a liner does not have a good root system, it is discarded. Liners are carried to the field on a tractor. A person on the back of the tractor drops the liners along a line. Three or 4 people use trowels to plant the liners. Two people follow these planters and level the bed with their hands starting at the outside edge and working towards the center. We feel that this helps maintain the contour of the beds and prevents sinking in the middle. In a good day of planting, we might get 18,000 to 20,000 liners in the ground. We use a Skinner irrigation system (no longer available) which applies water in a square pattern. We make sure the liners are not planted too deeply; we like them planted at the same level they were in the propagation medium. Soil is firmed around the liner as it is planted. The first watering-in is the most important. We make certain all the material we have added is absolutely wet by watering for several hours. For two year growth of an azalea, we plant on 12-inch staggered centers. We do plant some on 10 inch centers, not staggered, with 6 azaleas across the bed. We can grow these plants for one year, dig them in the winter when we have time, and pot them up.

In the past we have mulched with pine straw. Pine straw worked well, but it was not economically feasible as it took 2 weeks to rake straw. We have found that a light layer of dime to quarter size pine bark makes a very good mulch that will not settle out or shed water, but allows water to fall through.

The single greatest expense in growing azaleas in the field is weeding. We weed both in the one and two year stage. The methyl bromide treatment keeps the field very clean for 6 weeks or so in the one year stage. Starting sometime in mid-June we treat that field just like a second year crop. Weeding requires an average of 140 work-hours a week per field. As soon as the 6 to 8 workers weed the one year old crop, they go to the 2 year old field, then back to the one year old crop, etc. until the beginning of September. Recently we have inaugurated a program of chemical weed control using Roundup in all areas, including alleys, ditch banks, bed ends and roadsides in addition to our regular mowing program.

Pruning azaleas is another important aspect. We do this to encourage compact growth in both 1 and 2 year old plants. One year plants are lightly shaped in mid-July to remove rank growth. Liners can be pruned while they are still on the bench, but if they are not ready this must be done later in the field. Some we mechanically prune and use Off-Shoot-O while we let others grow out. The landscape demand is not for as tight and

compact a plant as is florist demand, so our method is determined both by cultivar and ultimate market.

Another important element of our field production is our fertilization program. Sometime in early June when visual inspection of plants indicates it is necessary, we give an application of Sta-green 12-6-6. A second feeding follows usually about mid-July. We use about 80 pounds to each bed or about 4 pounds per 100 square feet. In the past we have fertilized our one year crop with a Vertagreen quick release 8-8-8 lawn and turf fertilizer before the end of August. The theory was that the plants could take up the fertilizer before it leached out, and growth would slow up and harden off before the advent of cold weather. However, we have decided to discontinue this quick release feeding. At the end of August we are going to a very light application of slow release 12-6-6, about 2 pounds per 100 square feet, which will not push the plants. When the temperature drops, the plants slow up, but they maintain a very good color and healthy appearance.

The final element in our field production of azaleas is winter protection. We place hoops of 3/4 inch conduit over the beds at 10 to 12 foot intervals. We then stretch a 6 foot wide piece of Saran shade cloth from the first pipe the whole length of the bed, and wire it down. We take care to pull the Saran down on the east side where the sun first hits the plants. This is to avoid a quick thaw of the leaf tissue, which is what we feel does the damage. Additional elements of field winter protection include maintaining a good nutritional balance in the field, and keeping the plants well watered. If we know a freeze is coming, we water the bed thoroughly. We feel that a well watered plant can survive the cold much better than one lacking water.

PRUNING AND TRAINING OF ORNAMENTAL NURSERY TREES

WILLIAM R. STUDEBAKER

*Studebaker Nurseries, Inc.
New Carlisle, Ohio 45344*

All of you know how to prune a tree. There are many books on the theory of correct pruning and training, from the proper cutting angle, to developing main scaffold branches, to the proper time of year to prune. The problem in most nurseries is that you don't have time to trim all or any of your trees yourself, and furthermore may not have time to spend several seasons working with someone, teaching them by example how to prune. What I would like to focus on today is developing some